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## **CONTENT AREA EFFECTIVENESS: ENGLISH VS FILIPINO MEDIUM OF INSTRUCTION**

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### **Abstract**

*The rate of students who get low grades in the content areas is alarming, particularly in the subjects of Sciences and Mathematics. Among the different factors affecting level of achievements as considered by several studies, is the Language factor. The teaching of subjects in the content area in Philippine schools uses English as a Second Language (ESL), wherein a certain mastery of the English language has to precede, to understanding more of the subject. It is of great importance for teachers to evaluate the methods and techniques used in the process of teaching their subjects in order to raise level of performances of the students. This mini research aims to see the result of an evaluation of a classroom instruction while using monolingual instruction in ESL, or L2 that is English instruction, as compared with the use of bilingual instruction, in this case Filipino (the native language in the Philippines) and English combination. It is the hope of the researcher that the information gathered from this endeavor shall provide an insight for language educators and mathematics teachers to join forces in developing students' linguistic, verbal, and logical-mathematical intelligences.*

### **Keywords**

Linguistics, Bilingualism, Strategies, Mathematics, Content Area

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## **1. Introduction**

Language of instruction has been the topic of greatest controversy in the education of English Language learners, and by far the most volatile issue has been the use of English learner's primary language for instruction: Should English learners be taught skills in English which is just their second language (ESL) from the onset of their schooling, or should they be taught academic skills in their home language or their mother tongue? (Martin, 2010)

There is an alarming rate of students who get low grades in the content areas, particularly in the subjects of Sciences and Mathematics. Many studies have been conducted to know the different factors affecting their level of achievements. One of these is the Language factor (Lopez, et al. 1995).

Language ability of both the teacher and learner has been acknowledged to pass potential and actual barriers to learning in all content areas (Moralida, 1991). To understand the relationship between language and the subject, one needs to know the main components of the language as it is used in the classroom.

In teaching any subject in the content area, a certain mastery of the English language has to precede the understanding of the subject. It is of great importance for teachers to evaluate the methods and techniques used in the process of teaching his subject. In evaluating this method, the first question in hand is:

“Does the ability of speaking and understanding English affect the achievement of my students?”

Exact scenario in schools most often shows that students perform poorly in the content areas because of language barriers. The students tend to shy from reciting and asking questions because of their limited vocabulary skills. Results tend to support the use of the students' native language to reinforce concepts and skills and discuss difficulties as well as exploring the new information being given under each new lesson.

### **1.1 Statement of the Problem**

This mini research attempts to make a survey on what is the effective medium of instruction in the content area, particularly Mathematics. A math teacher was invited to teach one of their lessons using English as monolingual medium of instruction in one group of students (Group A) and another group using bilingual, a combination of English and Filipino (Group B) instruction. Specifically the research aims to answer the following questions:

- What are some of the feedback of sampled students toward the use of monolingual medium of instruction in L2 as compared with that of using bilingual medium of instruction in Mathematics 1?
- What significant difference do the students' post teaching evaluation test results have in Mathematics 1, taught using bilingual instruction with that of students' taught in monolingual medium of instruction?
- What medium of instruction in Math 1 is preferred by majority of the sampled students before and after teaching?
- What are some reasons of the students in their preference for medium of instruction in the teaching of Mathematics 1?
- What are some of the recommended solutions of the teacher regarding the difficulties encountered by the students in understanding the lesson?

## **2. Significance of the Study**

This mini research aims to see the result of an evaluation of a classroom instruction while using monolingual instruction in L2 that is English instruction, as compared with the use of bilingual instruction, in this case Filipino and English combination. It is the hope of the researcher that the information gathered from this endeavor shall provide an insight for language educators and mathematics teachers to join forces in developing students' linguistic, verbal, and logical- mathematical intelligences. Lifelong skills in communication, decision making and problem solving can be attained through interactive and integrative modes of teaching.

Furthermore, for instructional materials writers, math-oriented language materials or communication-rich mathematics materials can be produced as an innovation in curriculum and instructional design planning.

Teacher trainings and programs that give emphasis on systematic integration of the subject matter in the content area and language skills can be pursued in order for the teachers to cope with the cognitive demands of classroom instruction.

## **3. Methodology**

A group of freshmen students in the College of Education, during the 1st semester of school year 2010-2011 at a selected school in Quezon City are used in this study and they are enrolled in Mathematics 1. The teacher was invited to teach one of their lessons using English as

monolingual medium of instruction (Group A). This group has a total of 32 students. Another group (Group B), with a total of twenty (20) students is taught the same concepts using bilingual instruction, Filipino and English (Group B).

This research has employed two methods: descriptive survey and experimental method.

Group A was be the controlled group and Group B was the experimental group.

Two questionnaires were designed and developed. One is administered before the lesson presentation (Pre-teaching Information) and the second one is administered after the lesson presentation (Post-test information).

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#### A. Pre Teaching information

- Languages/dialects respondents use at home
- Personal assessment of students on their communication skills in both Filipino and English languages.

#### Medium of instruction Preferred in the teaching of Math 1

- Post Teaching information questions:
- Personal assessment of respondents on their level of understanding with the lesson presented.
- Difficulties respondents encountered in understanding the lesson
  - a. teacher factor
  - b. learner factor
  - c. other factors
- Medium of instruction students prefer in the teaching of Math 1 after lesson
- Presentation.
- Reasons stated by the respondents in their choice of medium of instruction.

After the lesson presentation of both groups, an evaluation test which is a teacher made test was conducted to see their level of understanding. Each lesson lasted for about one and a half hour, the usual length of time in a regular class in the school.

On treatment of data, the results of both groups on their evaluation tests were collected.

They are tabulated for analysis and evaluation. To determine the significance of difference between the two groups, a comparison was made finding the mean, and computing the

significance of difference using t-test of the post teaching test of the two groups. Likewise a comparison was made on the number of those who passed and failed the test. Raw scores are transmuted to percent (%) for convenience in tabulations, analysis and interpretation.

#### **4. Background Literature: Mathematics as a Language**

Math is a language and is not a recent phenomenon. Siskin (1996) cites Galileo in his ‘The Assayer’ written almost 4 centuries ago, who called this universe...

“A grand book which stands continually open to our gaze, but which cannot be understood unless one first learns to comprehend the language and read the letters in which it is composed. It is written in the language of mathematics and its characters are triangles, circles, and other geometrical figures without which it is humanly impossible to understand a single word of it; without these, one wanders about it in labyrinth...” (p. 231).

Today, Math is a far cry from that described by Galileo. It has grown by leaps and bounds with tremendous expansion of mathematical knowledge. There are now phenomenal advances in modern technology. Mathematical language is now integral in wide array of human activities, such as internet dealings, high speed communications, worldwide weather forecasts and space explorations.

When people talk of Mathematical language, what seems to be a common perception is that the language of Mathematics is alike a language of English in many ways. Usiskin observes that like all other languages, it has a well-constructed grammar, like that of a spoken language.  $2+5x$  and  $31.6 - 1/4$  are called expression; and  $x=4$  and  $5x + x < 40$  are sentences. The symbols  $+$ ,  $=$ , and  $-$  are verbs. Aside from syntax, math language has vocabulary, semantics, and discourse. Indeed the language of mathematics has much common with other languages; hence mathematics is like a language in a sense that it has some properties of the language. Another school of thought articulated by Usiskin is to generate awareness that the learning of mathematics could be made more effective if it is taught as a language and not like a language. It maintains the view that designations like symbolic language, formal language or abstract language give the impression that mathematics is a special kind of language that is more difficult to learn than a living 2nd language or one’s first language.

Like most modern languages, mathematics has its oral and written manifestations which can be expressed either in formal or informal modes. Just like all human language, the major

purpose of language of mathematics is communication. Maths describe concepts as well as helps shape them in the minds of the user.

Cooney and Hirsch (1990) suggest the need for both teachers and learners to distinguish between the language used in communication and the language of mathematics. Mathematical language is composed of a variety of linguistics structures such as vocabulary, grammatical patterns, functions and meanings. Language use in everyday communication is redundant, since it is not necessary to know the meaning of every word. The message can be conveyed through paralinguistic means and in context of communication. Such is not true with mathematical language. Words and phrases have precise meanings and represent ideas that must be understood to prevent the learner from not fully understanding the message conveyed.

The language of mathematics is context-reduced and cognitively demanding which exerts the use of what Cummins (1984) termed as Cognitive Academic language Proficiency (CALP). This is in sharp contrast with everyday interaction, which by its very nature is context-embedded and cognitively undemanding, thus, requiring a basic type of linguistic proficiency called Basic Interpersonal Communication Skills (BICS). Many of the linguistic demands of content subjects rely on CALP.

There are four (4) areas which Diaz, Rico et.al (1995) have identified as difficulties of Math students in their book *Math for Limited English Proficiency*. These are vocabulary skills, syntax, semantics, and discourse features.

#### **4.1 Vocabulary**

The problem of students of LEP with the lexicon of Math lies in the technical nature of word like numerator, subtrahend, exponent, and terms like power, mean and place value that have a meaning different from everyday usage. A variety of Math terms express the same math operations: subtract, less than, reduced by, minus, decreased by, take away, all stand for subtraction. Special symbols can be used in place of vocabulary terms.

#### **4.2 Syntax**

Dale and Cuevas (1992 in Diaz-Rico) observed that problems in syntax occur when students try to translate directly from English word order to the corresponding mathematical expression. This is true when they try to write math sentences in the same way they read or write English.

### **4.3 Emantics**

These problems occur when students infer from natural language to mathematical language. Students should be able to identify key words and determine the relationship of the other words to the key words. In Dale and Cuevas (1987) example ‘Five times a number is two more than ten times the number’. The student must recognize that “a number” and “the number” refer to the same quantity.

However, in the problem, “The sum of two numbers is 77. If the 1st number is ten times the other, find the number”, student should realize that they are dealing with two numbers.

### **4.4 Discourse features**

Math texts uses discourse features different from natural language. The tendency to interrupt for the inclusion of formulae could be confusing and frightening to readers for Math books. Readers should adjust their reading rate and read more slowly and repeatedly.

There shall be no communicative competence in mathematics if students cannot decode the English language. They should be able to “think and communicate” about Mathematics (Ramirez and Chiode, 1994).

Castro (1991) noted that Gonzales, Dela Salle University President, disclosed that studies and surveys reveal that majority of Filipinos have no objection to the use of both English and Filipino as media of instruction.

Pacis (1990) wrote that the latest obstacle to good education that has victimized Filipino pupils is the use of Tagalog, later Filipino, and still later Filipino as language of instruction. Theoretically, it is believed that education is more effective when done in pupil’s own native language. The entire history of education under the United States belies this story. The use of English throughout the educational system from 1st grade to graduate school, was completely successful

Former Education secretary Ricardo Gloria said that he will give stronger emphasis on the teaching of English in all schools because it is necessary in attaining goals of Philippines 2000. As we aim for “global competitiveness”, he further said that one of the top priorities of the government is the improvement of science and technology to speed up the country’s progress and turn “our graduates into world-class scientists”.

Sanchez (1994) shared the same view that at present, Japan and Indonesia have intensive teaching of English in their schools. They have learned the significance of knowing not only their national language but also the English language. She also stressed that based on researches,

poor communication skills in English contributes much to students' inability to pass government exams.

## **5. Results and Discussions**

### **5.1 Pre Teaching Information**

#### **5.1.1 Languages used by the students at home**

This study has taken the background languages or dialects used by the students at home. According to Murrell (1966), if one language is spoken at home, and the second is acquired in the classroom, balance seems to be upset and interference is great. As children grow older, the peer or the outside group plays an increasingly important role on what language becomes dominant. (Kuo, 1974).

The students of both groups come from all the varieties of dialects the country has. The comparison revealed that there are around seventy percent (70%) who uses Filipino as home dialects in group A as compared in group B, there are eighty percent (80%) who uses Filipino at home. The students uses Tagalog varieties ranging from Cebuano Hiligaynon, Bikolano and Kapampangan.

#### **5.1.2 Assessment of respondents on their communication skills in Filipino**

The pre teaching information data had asked students on how they perceived their communication skills. They are made to have a self-rating of their communication skills in both Filipino and English proficiency. This is to find out the readiness of students on the use of Filipino as their medium of instruction. The results revealed that majority of them has rated their listening skills as above average, and this is followed by about forty percent (40%) who said that they have excellent listening skills. Barely ten percent (10%) said they have average listening skills. On speaking ability around sixty percent (60%) said they are excellent speakers. Only ten percent (10%) admits they are average in their speaking skills. In reading, forty percent said they are excellent readers and only ten percent said they are on average. In writing, there are around sixty percent or 59.38% who said they are above average, and twenty percent (20%) said they are excellent. Only twelve percent (12%) said they are average. There are no responses in very poor and poor category.



### 5.1.3 Assessment of respondents on their communication skills in English

This study wanted to find out students' understanding of English as a medium of instruction through their self-ratings. The use of English as a medium of instruction shall reveal problems in lesson comprehension. Although in a study conducted by Borbon (1994), there is a big discrepancy in terms of ability to understand and interest level of students in the teaching of Mathematics.

This study revealed that of the total respondents half of them or 50% has rated themselves as above average in their listening skills, followed by the rating of their speaking abilities, where there are sixty five percent (65 %) who said that they are average. In reading skills, there are 20 or sixty two percent (62%) who said that they are above average. Only 4 or twelve percent (12%) said that they are excellent.

In writing, there are 15 or 46.88% who said that they are above average, followed by 14 or 43.75% said that they are average. Three (3) said that they are excellent. No students have rated themselves under very poor and poor category.

### 5.1.4 Medium of instruction respondents prefer in teaching Math

A comparison was done on the choices of medium of instruction preferred by the students before lesson presentation. It was revealed that majority of the students have expressed their choice of using both Filipino and English in the teaching of the subject. In group A, there are 18 or 56.25% while group B there are 12 or 60%. In group a, there are 8 or 25% wanted it in pure Filipino, and only 4 or 12.5% wanted the subject to be taught in English. In group B, there are 5 or 25% wanted the subject taught in Filipino and only 3 or 15% said it that their preference is in English.

## 5.2 Post Teaching Information

### 5.2.1 Assessment of respondents on their understanding of the lesson presented by the teacher

**Table 1:** *Respondents' Self Rate comprehension with the Lesson Presented*

Level of Understanding	Group A (English Medium)		Group B (Code Mixed)	
	N	%	N	%
1. Did not understand	0	0	0	0

<b>2, Moderately Understood</b>	6	18.75%	5	25%
<b>3. Well understood</b>	21	65.63%	15	75%
<b>No response</b>	5	15.63 %	0	0
<b>Total</b>	32	100.00%	2	100.00

The table above shows the result when respondents were made to rate themselves on their level of understanding after the lesson presentation. Under Group A or the English medium group, twenty one (21) or 65.63 % said that they understood well the lesson, and this is followed by six (6) or 18.75% said that they moderately understand. Nobody had answered that they did not understand and five (5) no response. Group B or the code mixed group on the other hand, has fifteen (15) or 75% said they understood well, followed by five (5) or 25% said they moderately understood. Likewise with this group, there was nobody who did not understand.

### **5.2.2 Respondents difficulty in understanding the lesson**

Majority of the students as a whole did not have difficulty in understanding the lesson. To compare, in Group A, there were twenty seven or 84.38% who said NO as compared with Group B wherein seventeen (17) or 85% likewise said NO. Group A has 5 or 15.63% who admitted they have difficulty and Group B has 3 or 15% said yes.

**Table 2:** *Responses on Having Difficulty in Understanding the Lesson*

Responses	Group A (English Medium)		Group B (Code Mixed)	
	N	%	N	%
<b>Yes</b>	5	15.63	3	15%
<b>No</b>	27	84.38	17	85%
<b>Total</b>	32	100	20	100

## 5.2 A- Identified difficulties of respondents in understanding the lesson

**Table 3:** Difficulties identified by the respondents in understanding the Lesson

A- Teacher Factors	Group A (N=32) English Medium		Group B (N=20) Code Mixed	
	N	%	N	%
1. Fast in Explaining	1	3.12%	0	0
2. Details not well presented	2	6.25%	3	15%
3. Cannot Understand some of the words Used by the teacher	2	6.25%	0	0
4. Others				

This is a follow-up question of those who answered that they have difficulties in understanding the lesson. The respondents were made to identify whether it is Teacher factor, learner factor or other circumstances. Among the five (5) in Group A, there were two (2) or 6.25% who said that the teacher is fast in explaining and also cannot understand some of the words used by the teacher, respectively, followed by one (1) or 3.12% who said the teacher is fast in explaining. Group B respondents on the other hand have three (3) who said that details not well presented, and no other responses.

There are multiple responses gathered from the respondents on their difficulties in understanding the lessons. Group A has three (3) who said that he's not feeling well that's why he had hard time getting the lesson, and this is followed by 2 or 6.25% who admitted that they are slow learners. Among the other factors they answered are; The room is hot, 2 or 6.25%; Other rooms are noisy 2 or 6.25% and only one or 3.12% said that he is not focused. In Group B, there are three (3) or 15% who said that they are not in the mood or not feeling well and also slow learners. Among other factors, the students responded that the room is hot, which is more of a complain.

**Table 4: Difficulties of Respondents in Understanding the Lesson Learner Factors and Other Factors**

B. Learner Factors	Group A (N=32) English Medium		Group B (N=20) Code Mixed	
	N	%	N	%
1. Not in the mood or not feeling well	3	9.38	3	15%
2. Slow Learner	2	6.25%	2	10%
<b>C. Other Factors</b>				
1. The room is hot	2	6.25%	3	15%
2. Other rooms are noisy	2	6.25%	0	-
3. Others (not focused)	1	3.12%	0	-

### 5.3 After Lesson Presentation, Medium of Instruction respondents prefer

The table below (table 5), finally shows what is the preferred medium of instruction by the students in the teaching of Mathematics 1 after the lesson presentation. Group A has 28 or 87.5% who prefers a combination of Filipino and English as medium of instruction while in Group B, there are 18 or 90%. There were 4 or 12.5% in Group A who preferred English as medium of instruction and only 2 or 10% in Group B.

**Table 5: Medium of Instruction Preferred by Students after Lesson Presentation**

Medium of Instruction	Group A (N=32) English Medium		Group B (N=20) Code Mixed	
	N	%	N	%
1. English	4	12.5%	2	10%
2. Filipino	0	-	0	-
3. Combination	28	87.5%	18	90%
<b>Total</b>	<b>32</b>	<b>100%</b>	<b>20</b>	<b>100%</b>

The research has no response from both Groups in the use of pure Filipino. Among the common reasons why students prefer the use of combination of English and Filipino in the teaching of Math 1 were:

- To be able to understand well;
- Terms in Filipino are clearer, although other terms remain as they were in English;
- Some English terms used in explanation are not understood; and

- The process is clearer when Filipino medium of instruction is used.

This study shows that Group A has 87.5% of students who prefer Combination of English and Filipino as medium of instruction in the teaching of Math 1 while Group B has 90% respectively.

On T-test results, this study involves the computation of means in the treatment of data of both groups on their post teaching assessment, followed by computation of t-test. This is to determine if there is a significant difference on the result of the post teaching test administered between the two groups. The study revealed that there is no significant difference between the result of post teaching test between the students taught using Monolingual (English) and that of using Bilingual (code-mixed). In short, the medium of instruction using English or monolingual is as good as using bilingual.

## **6. Conclusion**

In the initial and final phase of the research, pre teaching information and post teaching information data have revealed that students have more positive attitude in the use of Filipino and English or Code Mixing procedure in the presentation of the lesson. While there were few who still believed that English is an important medium of instruction for international recognition, students would rather prefer a code mixed instruction in order to get clearer understanding of the lesson.

Initial assessment of students of their English and Filipino proficiency showed that they believe they are on the average and above average scale. Few admitted that they are poor and a little more placed themselves on the scale of excellent. The students identified the use of Filipino as their native tongue and vernaculars which is used at home. Different Philippine varieties are identified and just a few uses English at home.

Majority understood well the lesson in both medium of instruction used (Pure English and Code mixed), and a few responded they moderately understood the lesson. Among the admitted difficulties in receiving the lesson are not getting the details well, followed by some vague words used by the teacher in the English language. A very insignificant percent admitted they are slow learners and not feeling well during the lesson presentation. Only one complained that the room is hot and is affecting his listening comprehension.

One common reason that students have in their preference of a code mixed instruction is to be able to understand well the concepts and process of mathematical problems. Some terms in Math may not be translated in Filipino, which has to be retained in their English terms, but students still prefer a code mixed instruction. The teacher recommended that students must really strive for an excellent proficiency in the English language as this is necessary to understand not only the Math subject but also other content areas like Sciences. The Math teacher shall focus more on its target lesson than give focus to language enhancement.

Lastly, the result of the achievement test or the evaluation test at the end of the lesson revealed that all of the students passed, and the use of any medium of instruction is insignificant with the result of the test. One limitation of the researcher here is the need for more evidences in order to compare their significant differences. The hypothesis regarding significant difference between the two groups in their achievement test is null. There is no significant difference between the two groups with the results of their achievement tests.

### **6.1 Recommendations**

The researcher would like to recommend the following:

- Pure Filipino is not favored by the students, but a combination of both English and Filipino. This means that the use of a code mixed medium of instruction might be a transition of pure English later on in the teaching of the content area subject like Mathematics 1. In the *Palisi ng Wika of the Sentro ng Wikang Filipino* (Policy of the Center for National Language) of the University of the Philippines, it states that “Filipino shall be a medium of instruction in the University Level within a reasonable time frame or transition period.” Students must slowly enhance themselves with English proficiency needed to understand Mathematics.
- There must be coordination between the Mathematics teachers and the Language teachers with regard to language use in the classroom. Aside from the issue on the use of English as medium of instruction, they could work on English for Specific Purposes (ESP) to enhance English proficiency while studying the content area. Syllabus may be designed in such a way that there is an integration of language activities or language focus in every lesson.
- In the course of transition from the use of code mixed instruction to English medium, there must be standard translations of technical terms that are used in the content areas. Dictionaries of Technical terms can be produced and published. Further surveys and

researchers can be done inside the classroom on the interaction between the students and teachers on code mixed languages used in the content area (Discourse analysis).

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